**Short Term Trading Models – Usage of Hurst Exponent**

**Context**

Most asset return processes can be characterized as containing a primary trend, along with meanreversion around that trend, as well as a certain amount of random noise. Econometricians classify these elements using a Hurst Exponent as black noise, pink noise or white noise. Intuitively traders wish to capitalize on either the trend or mean-reverting behaviour- often at different time frames since they are part of the same unified process. It is also a common belief that trends tend to occur at longer time frames and mean-reversion around that trend at shorter time frames. The key obstacle for both styles is to eliminate or minimize the impact of white noise on indicators that are used to measure either trending or mean-reverting behaviour. The failure to do so results in poor trading results due to false/random signals.

**This project aims to:**

* Analyse the effectiveness of Hurst Exponent Analysis for short term trading
* Develop modelling techniques to minimize effect of white noise.

**Scope of Research Project**

* Identify specific countries/markets/financial instruments to study. The instruments chosen should have sufficient liquidity to support short term trading.
* Collect and collate data of stock/contract prices for a representative section of instruments for that market.
* Analyse the historical effectiveness of Hurst Exponent analysis in developing alpha generation strategies in short term trading system under different market conditions
* Devise trading strategies leveraging Hurst Exponent along with other quantitative metrics suitable for short term system. **Consider realistic trading scenarios.**
* Analyze performance of such strategies in out of sample data
* Summarize and draw conclusions

**Short Term Trading Models – Improving Signal Precision through a broad market directional filter**

**Context**

Short term trading models depend on entry and exit signals calculated on smaller time frames and generally do not consider long term trend directions. Also, such trading models might be more susceptible to frequent whipsaws and the detrimental effect of transaction costs.

**This project aims to address questions like:**

* Can a broad market direction filter have a positive effect on short-term trading models?
* What other kind of signal filters would work best for short term mean reversion systems?
* An entry/exit signal filter would, by definition, decrease trade turnover rate, thus decreasing absolute profits for a positive expectancy system. Can the effect of a filter on a short-term trading system hence be mimicked by adjusting other parameters of the system that are easier to manage in real trading?

**Scope of Research Project**

* Identify specific countries/markets/financial instruments to study. The instruments chosen should have sufficient liquidity to support short term trading.
* Collect and collate data of stock/contract prices for a representative section of instruments for that market.
* Analyze the historical effectiveness of your chosen directional filtering technique in developing alpha generation strategies in short term trading system under different market conditions.
* Devise mean-reversion trading strategies leveraging your chosen directional filtering technique along with other quantitative metrics suitable for a short-term system. (Note: consider realistic trading scenarios.)
* Analyze performance of strategies in out-of-sample data. o Summarize and draw conclusions.

**Short Term Trading Models – Risk Mitigation for Mean Reversion Systems**

**Context**

Mean Reversion systems take positions in a market when it identifies significant divergence from the mean. As such the profile of Mean Reversion systems are characterized by capped profits and the possibility of uncapped losses. However, such systems have been traded quite profitably by traders and hedge funds over the years.

This project aims to address questions like:

* Managing Risks in Mean Reversion systems – which are the best contracts to trade?
* The benefits & problems of using stops in Mean Reversion System.
* The usage of profit targets and Mean Reversion systems and it effects. Determining the best place to start taking profits.
* The problem of letting your losses run – the effect of tail events on Mean Reversion Systems and how to mitigate risks Scope of Research Project
* Identify specific countries/markets/financial instruments to study. The instruments chosen should have sufficient liquidity to support short term trading.
* Collect and collate data of stock/contract prices for a representative section of instruments for that market.
* Analyze risk profiles of mean reversion systems under different conditions. Also identify and analyze the effects on profit targets, stops etc on the said profiles.
* Devise mean-reversion trading strategies leveraging your chosen set of metrics (stops/targets etc) along with other quantitative metrics suitable for short term system. Consider realistic trading scenarios.
* Analyze performance of such strategies in out of sample data o Summarize and draw conclusions

**Short Term Trading Models – Martingale/Anti Martingale Strategies for Mean Reversion Trading**

**Context**

Popularized in the 18th century, the martingale was introduced by the French mathematician Paul Pierre Levy. The martingale was originally a type of betting style based on the premise of "doubling down." The system's mechanics involve an initial bet; however, each time the bet becomes a loser, the wager is doubled such that, given enough time, one winning trade will make up all of the previous losses.

**This project aims to:**

* Analyze the effectiveness of martingale betting strategies for Short Term Mean Reversion systems
* Analyze risk and reward profiles of such betting systems and benchmark it against black swan events
* Seek alternative position sizing methods for mean reversion systems that improves the system performance profiles

**Scope of Research Project**

* Identify specific countries/markets/financial instruments to study. The instruments chosen should have sufficient liquidity to support short term trading.
* Collect and collate data of stock/contract prices for a representative section of instruments for that market.
* Analyze the historical effectiveness of Martingale Position Sizing techniques in developing alpha generation strategies in short term trading system under different market conditions
* Devise mean-reversion trading strategies leveraging Martingale/Anti- Martingale/Mixed position sizing techniques along with other quantitative metrics suitable for short term system. Consider realistic trading scenarios.
* Analyze performance of such strategies in out of sample data
* Summarize and draw conclusion

**Other Related Topics**

* HANDLING DATA MINING BIASES
* TREND RELATIVITY
* CROSS MARKET ANALYSIS